A2G200N1200EP

1200V SiC MOSFET Module

Features

- High current density
- Low inductive design
- Low switching losses
- Integrated NTC temperature sensor
- Rugged mounting due to integrated mounting clamps

Potential Applications

- High Frequency Switching application
- DC/DC converter
- Solar applications
- UPS systems

Product Summary

V_{DS}	1200V
I_D	200A

Package

Symbol	Parameter	Value	Unit
V_{isol}	Isolation test voltage (DC 2mA 5s)	4.2	kV
	Internal isolation	ZTA	
L_{sCE}	Stray inductance	12	nH
T_J, T_{stg}	Junction and Storage Temperature Range	-40 to +150	°C
M_s	Mounting force per clamp (M4)	20 – 50	N
$R_{\theta JC}$	Thermal Resistance, Junction-to-heatsink	0.3	°C/W
M	Weight	23	g

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	1200	V
V_{GS}	Gate-Source Voltage	-10/+22	V
I_D	Drain Current (continuous)	200	A
I_{DM}	Drain Current (pulsed)	400	A

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Break down Voltage	V_{GS}=0V	1200			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=1200V, V_{GS}=0V			200	uA
I_{GSS}	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=20V			2	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=20mA	2		4	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS}=20V, I_D=100A		8	11	mΩ
V_{GSon}	Recommended turn-on Voltage	Static		18		V
V_{GSoff}	Recommended turn-off Voltage			-5		V
R_G	Gate Resistance	V_{GS}=0V, f=1MHz		1.1		Ω
C_{iss}	Input Capacitance	V_{DS}=1000V, f=1MHz V_{AC}=25mV		13.7		nF
C_{oss}	Output Capacitance			0.58		
C_{rss}	Reverse Transfer Capacitance			0.026		

E_{on}	Turn-On Switching Energy	V_{DD}=800V, V_{GS}=-5/+20V		5.2		mJ
E_{off}	Turn-Off Switching Energy	I_D=50A, Load=68uH		1.4		mJ
Q_{GS}	Gate-Source Charge	V_{DD}=800V		153		nC
Q_{GD}	Gate-Drain Charge	V_{GS}=-5/+20V		156		
Q_G	Total Gate Charge	I_D=100A		476		
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=800V		52		ns
t_r	Rise Time	V_{GS}=-5/+20V, I_D=100A		38		
$t_{d(off)}$	Turn-off Delay Time	T_J=175°C		81		
t_f	Fall Time	R_{Gext}=2.5Ω, RL=68uH		17		

Typical Performance-Reverse Diode (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	V_{GS}=0V, I_F=100A		3.5	6	V
I_S	Continuous Diode Forward Current	V_{GS}=0V, T_C=25°C		100		A
t_{rr}	Reverse Recovery Time	V_{GS}=-5V, I_F=100A		98		ns
Q_{rr}	Reverse Recovery Charge	V_R=800V		1226		nC
I_{rrm}	Peak Reverse Recovery Current			36		A

NTC-Thermistor

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	T_{NTC}=25°C		5.00		kΩ
ΔR/R	Deviation of R_{100}	T_{NTC}=25°C, R_{100}=493.3Ω	-5		5	%
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1(298{,}15\ K))]$		3375		k
$B_{25/80}$	B-value	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1(298{,}15\ K))]$		3414		k
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1(298{,}15\ K))]$		3436		k

Typical Performance

Figure 1. Output Characteristics

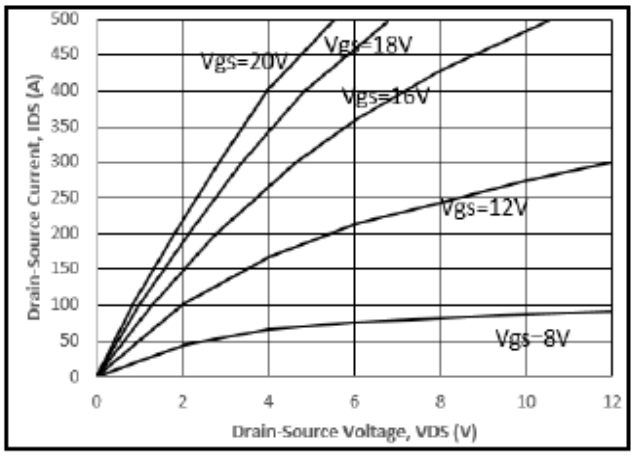


Figure 2. Normalized On-Resistance vs. Temperature

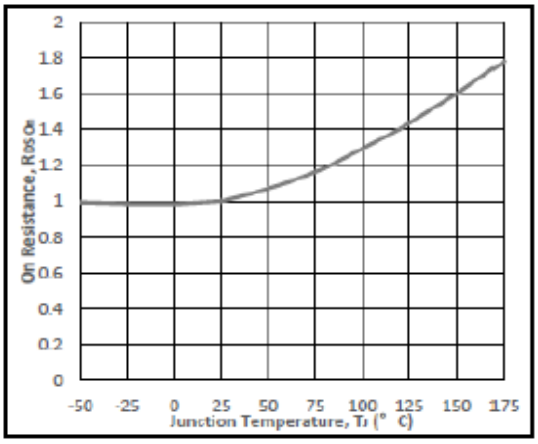


Figure 3. Threshold Voltage vs. Temperature

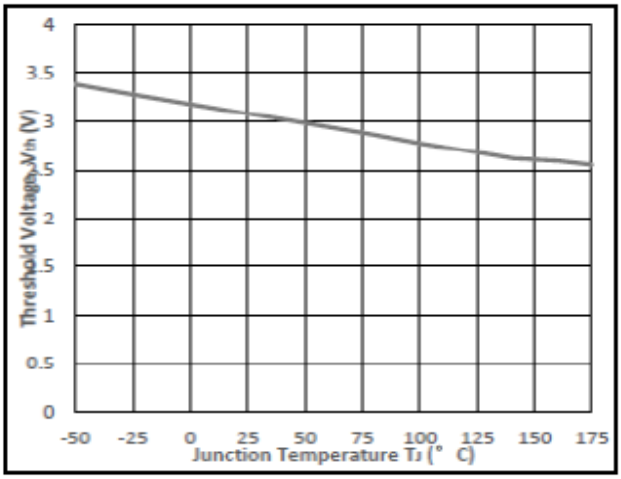


Figure 4. Transfer Characteristic for Various TJ

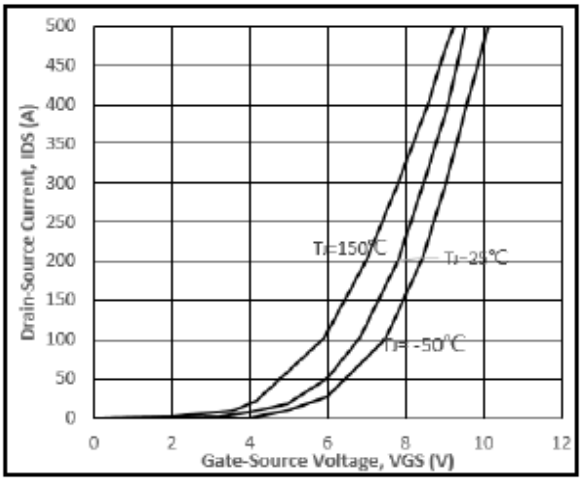


Figure 5. Diode Characteristic at 25 °C

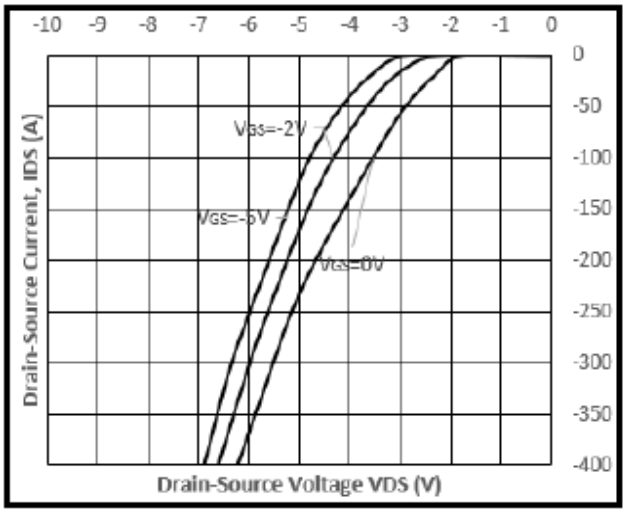


Figure 6. Typical Gate Charge Characteristics

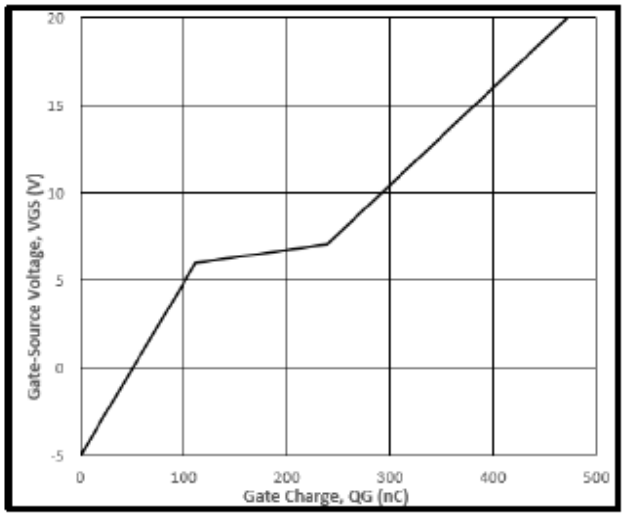


Figure 7. Typical Capacitances vs. Drain-Source Voltage

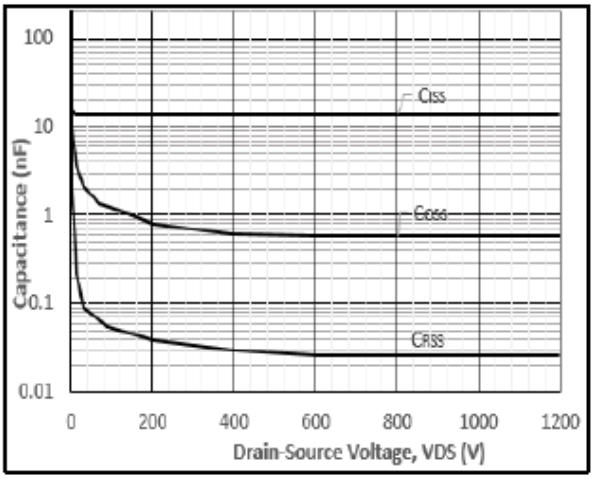


Figure 8. Inductive Switching Energy vs. Drain Current

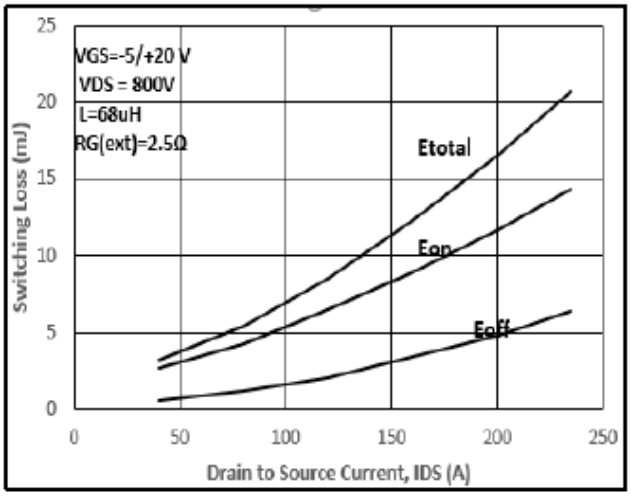


Figure 9. Switching Time Description

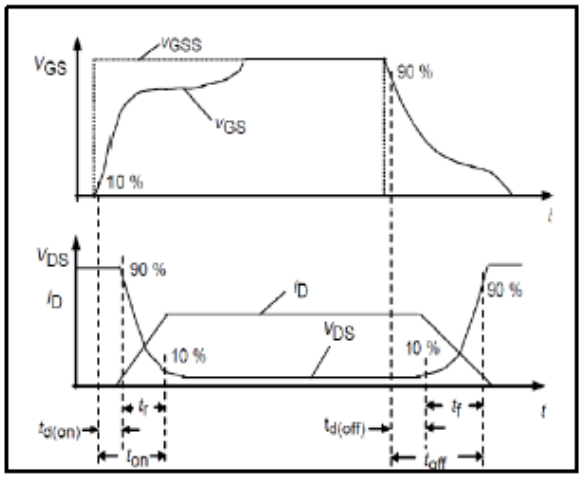
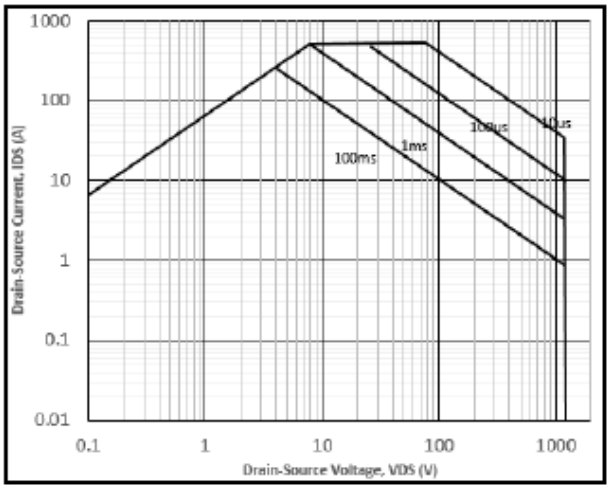
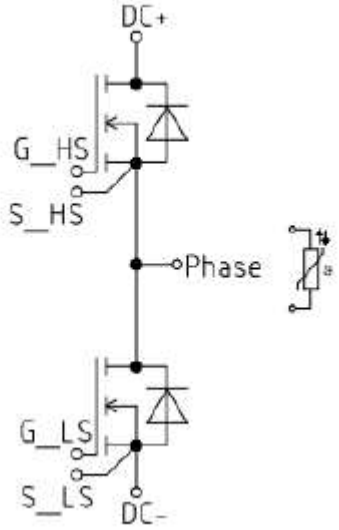


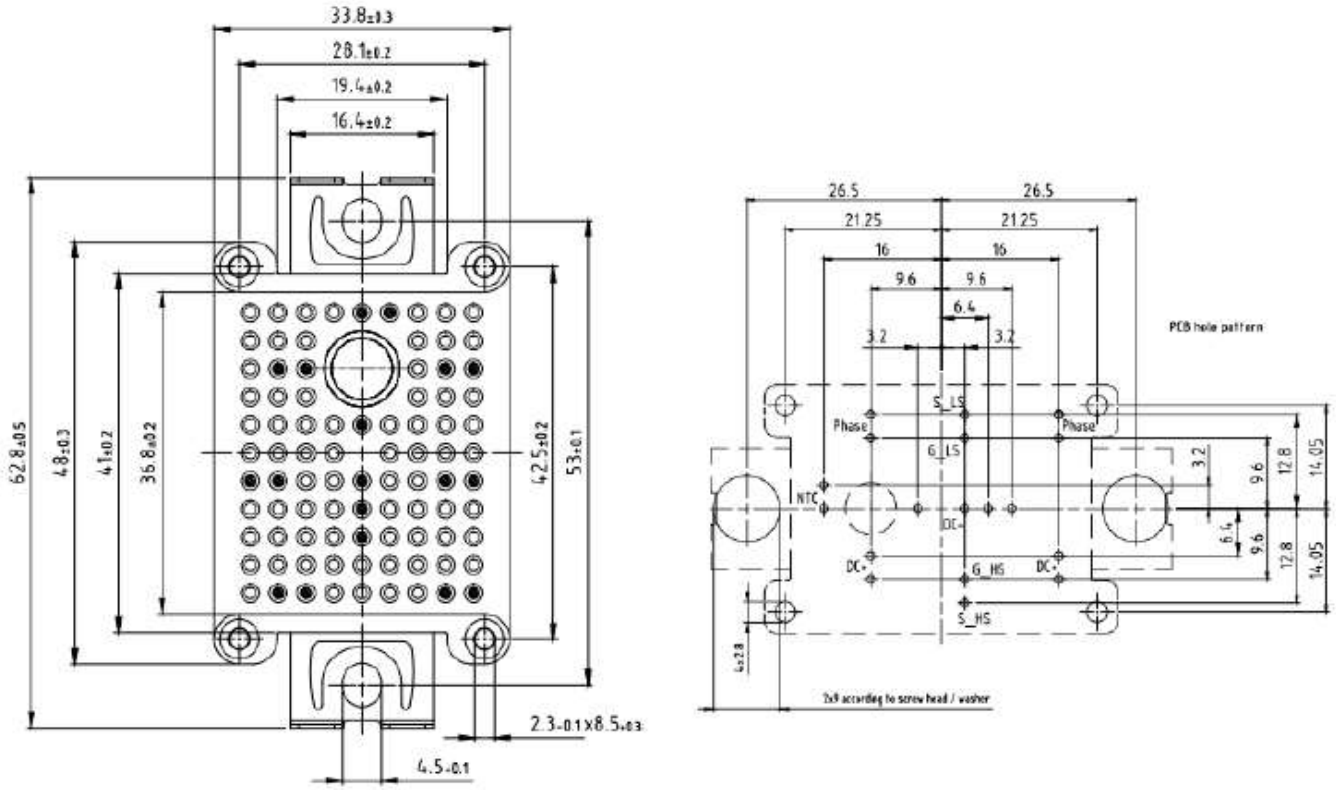
Figure 10. Safe Operating Area



Circuit Diagram



Package Drawing (mm)



Revision version	Description	Date
1.0	Initial	03.2024